

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 to 4 (Cancelled).

5. (New) A spent liquor recovery boiler system comprising:

a boiler further comprising a water or steam circulation system having superheaters and a furnace for recovering energy and chemicals from spent liquor combusted in the furnace;

walls of the boiler further comprising a plurality water cooled tubes in fluid communication with the water or steam circulation system;

at least one cavity having cavity walls formed of water cooled tubes in fluid communication with the water or steam circulation system;

a fuel combustor arranged in the at least one cavity;

at least one outlet for discharging combustion gases from the cavity to the boiler,

and

an interior of the at least one cavity having a cavity heat exchanger for superheating steam generated by superheaters in the boiler.

6. (New) The system according to claim 5 wherein a part of the walls of the at least one cavity is formed of the walls of the boiler.

7. (New) The system according to claim 5 wherein the at least one cavity is located on a front wall of the boiler.

8. (New) The system according to claim 5 wherein the at least one outlet of the cavity is in a front wall of the boiler and said outlet is opposite to a bullnose section of a rear wall of the boiler.

9. (New) The system according to claim 5 wherein the at least one outlet for the cavity is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream of the superheaters of the boiler.

10. (New) A liquor recovery boiler system comprising:

a boiler further comprising at least one wall defining a furnace, at least one liquor injector arranged to inject liquor into the furnace, and at least one superheater arranged in a flue gas passage for combustion gases generated in the furnace,

a plurality of water cooled tubes arranged in the at least one wall defining the furnace;

at least one cavity separate from the furnace and having walls formed of water cooled tubes, wherein fluid flowing through the water cooled tubes of the wall defining the furnace flows through the water cooled tubes of the cavity and to the at least one superheater;

a fuel combustor arranged in the at least one cavity;

at least one outlet for discharging combustion gases from the cavity to the boiler,
and

an interior of the at least one cavity being provided with a heat exchanger which

receives superheated steam from the at least one superheater.

11. (New) The liquor recovery boiler system of claim 10 wherein the liquor injector discharges spent liquor into the furnace.

12. (New) The liquor recovery boiler system of claim 10 wherein the at least one superheater is a plurality of superheaters arranged in a flue gas stream of the boiler.

13. (New) The liquor recovery boiler system of claim 12 wherein a part of the walls of the at least one cavity is formed of the water cooled tubes of the walls of the boiler.

14. (New) The liquor recovery boiler system according to claim 10 wherein the at least one cavity is located on a front wall of the boiler.

15. (New) The liquor recovery boiler system according to claim 10 wherein the at least one outlet for combustion gases is connected to the boiler and provides a conduit for combustion gases from the at least one cavity to be discharged immediately upstream of the superheaters of the boiler.

16. (New) The liquor recovery boiler system according to claim 10 wherein the outlet of the cavity is in a front wall of the boiler and said outlet is opposite to a bullnose section of a rear wall of the boiler.

17. (New) The liquor recovery boiler system according to claim 10 further comprising a gasifier for gasifying a biomass material and said gasifier produces combustion gas provided to the fuel combustor of the cavity.

18. (New) The liquor recovery boiler system according to claim 10 wherein the cavity is adjacent an outside surface of the at least one wall of the furnace.

19. (New) A method for superheating steam in a recovery boiler having at least one wall defining a furnace and a separate combustion cavity, said method comprising:

a. injecting spent liquor in the furnace to generate hot combustion flue gases in the boiler;

b. cooling the at least one wall by flowing cooling fluid through the wall;

c. generating hot combustion gases in the cavity;

d. cooling a wall of the cavity by flowing cooling fluid from the wall of the boiler through the wall of the cavity, and

e. passing cooling fluid from the wall of the cavity to a superheater arranged in a flue gas passage of the boiler.

20. (New) The method of claim 19 wherein the hot combustion gases in the cavity are discharged into the boiler upstream of the superheater.

21. (New) The method of claim 19 further comprising passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity.

22. (New) The method of claim 19 wherein the cooling fluid flows vertically upward through the wall of the furnace and then to the cavity.

23. (New) The method of claim 19 wherein the cooling fluid in the superheater is heated to a temperature no greater than 520⁰ C.

24. (New) The method of claim 19 further comprising passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity, and wherein the fluid in the superheater is heated to a temperature no greater than 520⁰ C and the fluid in the heat exchanger is heated to a temperature in a range of 500⁰C to 600⁰C.

25. (New) The method of claim 19 further comprising passing fluid from the superheater in the gas passage of the boiler to a heat exchanger in the cavity, and wherein the fluid in the superheater is heated to a temperature in a range of 480⁰C to 520⁰ C and the fluid in the heat exchanger is heated to a temperature in a range of 500⁰C to 600⁰C.

26. (New) The method of claim 19 wherein the combustion gases in the cavity are generated by combustion gases generated in a gasifier that gasifies a biomass material.

27. (New) The method of claim 26 wherein the biomass material is selected from a group consisting of natural gas, LPG, oil, methanol and liquefied biomass.